



EXPERT NETWORK MONITORING PLAN

# RANGIFERS

SUPPORTING PUBLICATION TO THE  
CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM  
FRAMEWORK DOCUMENT



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Greenland Home Rule, Ministry of the Environment, Nuuk, Greenland  
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Nenets Autonomous Okrug, Russia. Photo courtesy of Association of Nenets people  
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Supporting publication to the  
Circumpolar Biodiversity Monitoring Program  
Framework Document

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and

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**CAFF CBMP Report No. 5**

November 2004





II Congress of Reindeer Herders of Russia, Salekhard, Yamalo-Nenets Autonomous Okrug, Russia.  
Photo courtesy of RAPION

## Acknowledgements

Circum-Arctic Rangifer Monitoring and Assessment (CARMA) coordinators have received funding to help launch the CARMA network from a number of sources:

- **U.S. National Science Foundation/Arctic Systems Science Program in the Office of Polar Programs**, through the “Sustainability of Arctic Communities” project. NSF funded research has been used to develop and test a model of community-based ecological monitoring and assemble historical data for many North American caribou populations.
- **Northern Ecosystem Initiative (NEI)**. Environment Canada’s NEI has provided funding to develop some of the indicators (e.g. harvest data, body condition data), and conduct protocol workshops. NEI was the primary sponsor of the official launch of the CARMA Network in late October 2004.
- **International Arctic Science Committee (IASC)** has funded a project on the “Human Role in Reindeer/Caribou Systems” to stimulate international research. IASC funding has provided opportunities to meet

with a number of partners in Russia and Fennoscandia. IASC funds were also provided to support several partners to attend the official launch of the CARMA Network in October 2004.

- **Canada’s Climate Change Action Fund (CCAF)** – CCAF provided funds to develop indicators and support for the organization of the October 2004 launch.

**NOTE:** *The following network mission, principles, etc. should be considered a draft. This report is being written one week before the workshop to officially launch the CARMA network. The organization and scope of the network will be finalized at that workshop.*



Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

## Background

In February 2000, the Conservation of Arctic Flora and Fauna Working Group of the Arctic Council (CAFF) met in Iceland to respond to an Arctic Council recommendation that a circumpolar monitoring network be established. CAFF proposed that one of the networks monitor Rangifer populations and the human interactions with this important resource.

In cooperation with the International Arctic Science Committee (IASC), the selected network coordinator for Rangifers, Don Russell, and the IASC Project Leader, Dr. Gary Kofinas organized an international meeting in Minary, New Hampshire. The purpose of this meeting was to discuss, among other topics, the value and structure of a Rangifer monitoring and assessment network. At the Minary meeting, 62 potential indicators of a Human/Rangifer system were identified. Interim country representatives were also identified as contacts for a developing network.

During the following two years, a number of initiatives have been undertaken to:

- Secure funding for the network
- Build an initial GIS project that spatially represents all Rangifer populations



Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

- Develop web-based communication tools
- Present the network concept and solicit feedback at regional, national and international fora
- Refine the principles of a network
- Scope out the feasibility of monitoring specific circumpolar indicators
- Assemble retrospective data, and
- Assess trends of change in a number of the indicators

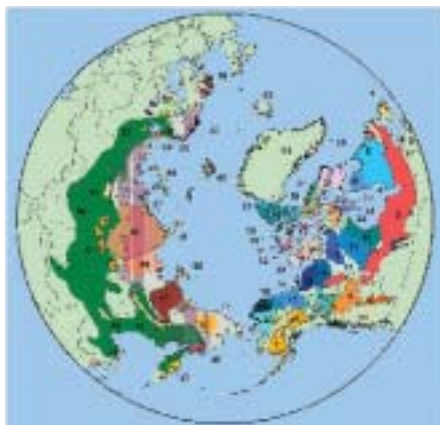
Figure 1 illustrates the circumpolar distribution of *Rangifer* species.



Nenets reindeer herders from Kanin Peninsula in the forest of the Mesen Region in the "Kanin" community, Kuloy River Onset, Mezen Region, Archangelsk Oblast. Photo courtesy of Association of the Nenets people of Yasavey



# Figure 1: Circumpolar distribution of Rangifer herds



- |    |                                  |    |                               |
|----|----------------------------------|----|-------------------------------|
| 1  | Newfoundland                     | 32 | Banks Island                  |
| 2  | Boreal                           | 33 | Northwest Victoria            |
| 3  | Atlantic                         | 34 | Dolphin-Union                 |
| 4  | Southern Mountain                | 35 | Chukotka                      |
| 5  | Northern Mountain                | 36 | Sudrunskaya                   |
| 6  | Yukon                            | 37 | Yana-Indigirka                |
| 7  | Alaska                           | 38 | Novosibirski Ostrova          |
| 8  | George River                     | 39 | Lena-Olenek                   |
| 9  | Leaf River                       | 40 | Taimyr                        |
| 10 | Qamanirjuaq                      | 41 | Severnaia Zemlia              |
| 11 | Beverly                          | 42 | Gydan                         |
| 12 | Ahiak                            | 43 | Belyi                         |
| 13 | Bathurst                         | 44 | Novaya Zemlia                 |
| 14 | Bluenose East                    | 45 | Svalbard                      |
| 15 | Bluenose West                    | 46 | Parapolskii                   |
| 16 | Cape Bathurst                    | 47 | Kamchatka                     |
| 17 | Porcupine                        | 48 | Amur                          |
| 18 | Central Arctic                   | 49 | Okhotsk                       |
| 19 | Teshekpuk                        | 50 | Yakutsk                       |
| 20 | Western Arctic                   | 51 | Evenkiya                      |
| 21 | South Baffin Island              | 52 | Nadym-Pur (Yamal)             |
| 22 | Coats Island                     | 53 | Arkhangelsk Oblast            |
| 23 | South                            | 54 | Terskiill Bereg (Kola)        |
| 24 | Lorillard                        | 55 | Laplandskii Zapovednik (Kola) |
| 25 | Wager Bay                        | 56 | Range of Forest Reindeer      |
| 26 | North Baffin Island              | 57 | Finland                       |
| 27 | Northeast Baffin Island          | 58 | Norway                        |
| 28 | Eastern Queen Elisabeth Island   | 59 | Iceland                       |
| 29 | Bathurst Island                  | 60 | Greenland                     |
| 30 | Prince Of Wales-Somerset-Boothia | 61 | Greenland Feral Reindeer      |
| 31 | Western Queen Elisabeth Island   | 62 | Range of Domestic Reindeer    |

## Mission

Through cooperation, both geographically and across disciplines, monitor and assess the impacts of global change on the human/Rangifer system across the Circum-Arctic.

## Principles and Scope of the Network

***Be simple and relevant.*** There is tremendous depth and breadth of activities in managing and assessing the status of Rangifer populations in the Circumpolar North. It is impossible for any network to try to include all these activities. The success of the network will depend on the ability to identify the common, relevant indicators that, when examined on a circumpolar basis, help our partners better understand their herds and the factors that impact their well-being.

***Focus on wild Rangifer populations.***

The network is initially concerned with large migratory Rangifer herds and their user communities; thus less emphasis is placed on woodland/forest and Peary/marine Rangifer populations. As well, particularly in Russia and Alaska, there are issues related to wild populations impacting domestic reindeer enterprises. The network will consider the

magnitude and trends of that interaction, but not other indicators of domestic reindeer husbandry. The network will explore opportunities for broadening the scope of the network to consider domestic reindeer in the future.

***Be dynamic; herd-specific data can be added at any time.*** We propose an open network where new herds and/or regions, new indicators and new partners can be added on an ongoing basis.

***Be a central depository for historical and current information on Rangifer indicators.*** The communication tools will be web-based and will serve as a site that researchers, managers, and co-management groups can visit to obtain up-to-date information on Rangifer herds.

***Include community, industry, university, and agency-based monitoring information.***

The network will access existing information from a number of sources and integrate them where feasible. Local knowledge, field-based biological monitoring, and remote sensing are all considered critical elements in the CARMA Network, and provide an important means for



Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

linking scales of analyses to arrive at a complete picture of regional and circumpolar perspectives. As funding for a comprehensive CARMA Network is at present very limited, activities will initially focus on using existing monitoring activities rather than initiating new data-collection initiatives.

***Provide annual analyses of Rangifer-relevant indicators across the Circumpolar North.***

On an annual basis, the network will provide a Circum-Arctic summary of the status of indicators of the human/Rangifer system.

***Provide a forum for standardized protocols in collecting, documenting, and assembling indicators.***

Although not requiring standardized protocols, the network will provide recommended protocols that are available to monitoring programs. Providing standard protocols will gradually allow participants to modify existing or initiate new monitoring programs whenever feasible.

***Provide annual “value-added” indicators that all regions can share.***

A major value-added benefit of the network will be the provision of a circumpolar compilation of annual climatic and habitat conditions. Indicators such as snow conditions (depth, water equivalent), snow melt and green-up can be provided utilizing existing projects that provide this information on a periodic basis. We will use these existing projects and target specific ranges of specific herds.

***Provide a forum for the exchange of ideas.***

Using the web-based communication tools, we are able to provide a site for an informal exchange of ideas, observations and activities.

## Network Organization

The coordination of the CARMA Network will rely on information from partner countries regarding their wild herds and observations from their communities. As well, Circum-Arctic monitoring data from existing remote sensing platforms (i.e. satellite, weather stations) will be obtained. All of these data will be integrated and periodic reports and assessments produced. Figure 2 summarizes the flow of information and products produced by the CARMA Network. The Canadian Wildlife Service of Environment

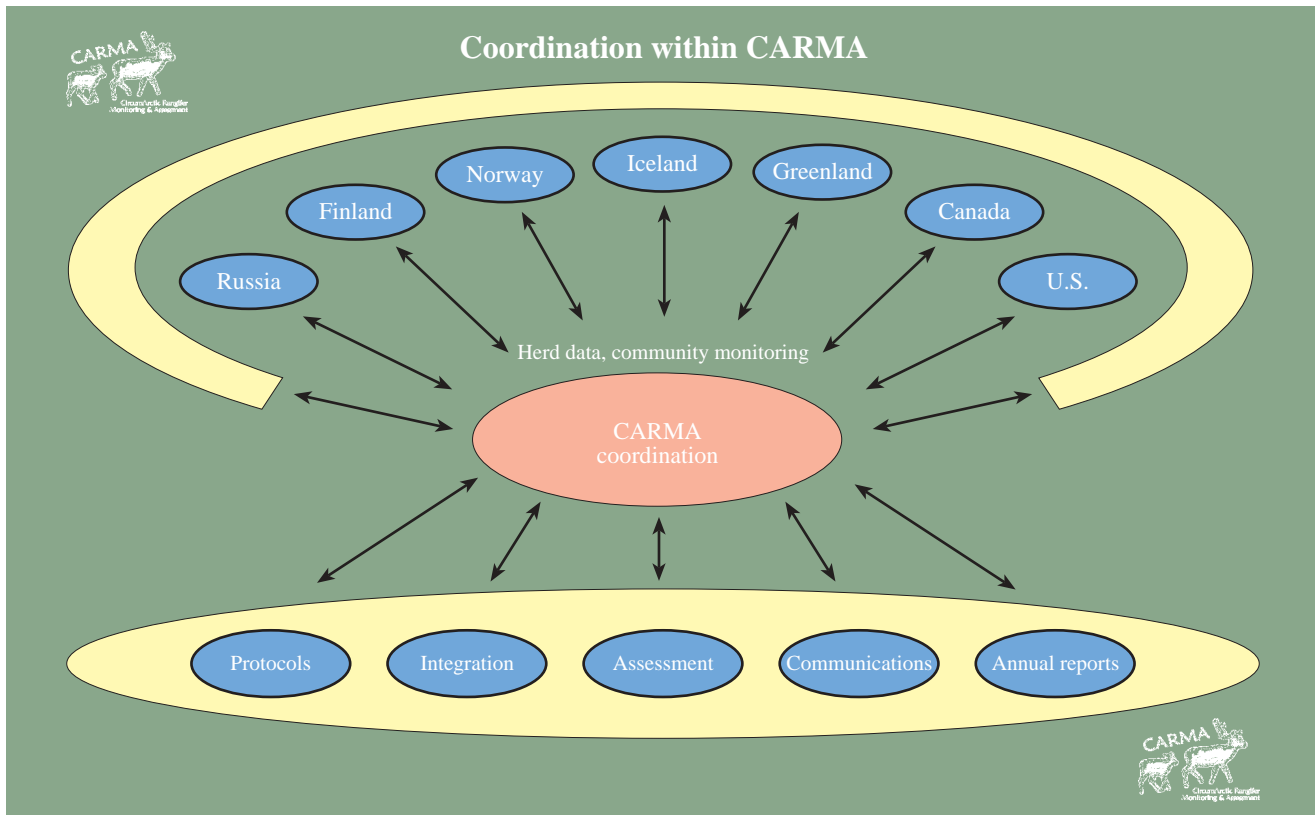


Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

Canada and the Institute of Arctic Biology of the University of Alaska are prepared to serve as interim coordinating organizations for the CARMA Network during its start-up phase.



**Figure 2: Flow of information and products produced by CARMA**



## Network Activities to Date

Since CAFF directed the creation of this network in Reykjavik, Iceland in February 2000, a number of activities have been conducted:

1. Meeting in Minary, New Hampshire. An international team identified the value and the elements of a monitoring program, listed key indicators that could be included in the monitoring project, and identified interim country contacts that could provide input once the network is under way.
2. A monitoring web site was developed under the Human Role in Reindeer/Caribou Systems portal at [www.rangifer.net/carma/](http://www.rangifer.net/carma/)
3. The monitoring program was "showcased" in a number of workshops and fora over the last 2 years. A poster was created and presented at symposiums.
4. Russell participated in the second meeting of CAFF in Akureyri, Iceland in March 2003 to provide an update and assist in the development of a proposal for the EU. The proposal was subsequently turned down.
5. Kofinas and Russell attended meetings to develop a new NSF program (SEARCH) and highlighted the need to fund monitoring programs.

6. Kofinas and Russell submitted a funding proposal to NSF, examining the human role in reindeer/caribou systems. The monitoring program was a component of the proposal.
7. A significant component of the CARMA Network will be community-based monitoring. Major progress has been made on developing the protocols for community-based monitoring, with sites established and in development in the Yukon, Northwest Territories, Nunavut, and Alaska.
8. Kofinas and Russell participated in an international workshop in Yakutsk, Siberia, where number of researchers, academics, managers, and community representatives discussed the present state of Human Rangifer Systems. The elements of a monitoring program were discussed and the Russian contacts that are willing to participate were identified. Initial retrospective data for selected Russian wild herds is being supplied.
9. A database of North American caribou herds has been developed and a retrospective analysis of a number of indicators is complete.
10. Russell attended the annual meeting of IASC in Reykjavik, Iceland in April 2004 to outline the plans for an international project, including monitoring, focusing on wild reindeer/caribou and how global change will impact northern peoples.
11. In preparation for the launch of the network, two workshops have been held in North America – one on the development of protocols for community-based monitoring of caribou body condition and a second on the characteristics and status of North American calving grounds (proceedings available).
12. An informal one-day workshop was held in Girdwood, Alaska in May 2004 in conjunction with the North American Caribou Workshop to discuss the principles and organization of the network.

## Indicators

The following is a minimum list of indicators that will be tracked by the CARMA Network.



Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

## Habitat Indicators

***Snow Water Equivalent*** - maps are produced and are available through the Snow and Ice Data Center at the University of Colorado. These maps provide circumpolar monitoring of snow conditions on a 2-week basis.

***Data from Weather Stations*** - CARMA will have access to weather station data through Environment Canada partners.

***Normalized Difference Vegetative Index (NDVI)*** – CARMA will make use of NOAA products that track green-up across the circumpolar north.

***International Tundra Experiment (ITEX)*** – CARMA will link into this existing network which monitors climate impacts on tundra vegetation.

## Biological Field Study Indicators

A number of indicators commonly monitored across herds will be tracked. The frequency of monitoring and the specific set of indicators actually monitored vary from herd to herd. A common set could include:



Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

- Population size
- Movements
- Disease and parasites
- Calving success
- Mortality
- Recruitment
- Body condition



Nenets Autonomous Okrug, Russia. Photo courtesy of Association of the Nenets people of Yasavey

## Community-based monitoring

Community-based monitoring varies considerably among the partner countries, from unstructured observations in narrative format to detailed monitoring and assessment data, such as those from the US-Canada Arctic Borderlands Ecological Knowledge Cooperative. Community-based monitoring can serve as the primary means of linking social and economic indicators. The CARMA Network will attempt to incorporate all levels of community information contributed to the network.

## Future developments

The official launch of the network will be in Vancouver, October 31, 2004 and November 1, 2004. A workplan will be finalized at that time.

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